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**NEW AND LITTLE KNOWN MAMMALIA FROM THE PORT KENNEDY
BONE DEPOSIT.**

BY E. D. COPE.

The notes contained in the following pages are based on material acquired by the Academy of Natural Sciences of Philadelphia from the locality above mentioned, and are preliminary to a complete and illustrated report which I hope to be able to publish after a full investigation of all accessible material. This paper extends and modifies the conclusions communicated to the Academy at the meeting of December 5th, 1895, where a general survey of the results was given. After a fuller study of the material presented, I have been compelled to reduce the relative number of existing species whose remains have been recovered. While the total number of species of mammalia is thirty-eight, the number of existing species is only six. They are as follows :

Erithizon dorsatum L.

Castor fiber L.

Lepus sylvaticus Bachm.

Ursus americanus L.

Felis eira Desm.

Lynx rufus Guld.

The remains of birds are not abundant, and consist chiefly of a species of turkey (*Meleagris*). Of reptiles there are a snake of the genus *Zamenis* and three species of turtles. One of the latter seems to be identical with the existing *Clemmys insculpta* Lec., while the others are apparently new. One is a large form, perhaps referable to *Clemmys*, and the other is a box tortoise.

BRUTA.

Megalonyx wheatleyi Cope.

This species was extremely abundant at the period when the fissure was open, fragments of at least sixty individuals having been obtained. The species is uniformly smaller than *M. jeffersonii*, and differs from it constantly in the form of the canine molars. Material for determination of the cranial characters has been found.

Study of the specimens shows that *M. dissimilis* Leidy was founded on inferior canine molars of *M. jeffersonii*, and that the teeth so named by me are the corresponding teeth of *M. wheatleyi*. *M. sphenodon* was founded on teeth of young individuals of *M. wheatleyi*. *M. loxodon* and *M. tortulus* are sustained as distinct.

GLIRES.

Anaptogonia hiatidens Cope. Proc. Amer. Philos. Soc., 1871, p. 91, fig. 18.

I have described from the Wheatley collection several species allied to or belonging to the voles, and in this paper I add two others. These forms are referable to those genera, which are defined as follows:

Pulp cavity and lateral grooves closed below; teeth rooted;

ANAPTOGONIA Cope.

Lateral grooves and pulp cavities open below; no roots;

MICROTUS Selys.

The first term in the Microtine series of genera is the genus *Anaptogonia*, where the crowns of the molars are short at maturity, and there are rather elongate roots. This is naturally the primitive genus, and it is interesting now that two fossil species referable to it have been discovered.¹

But one species of *Anaptogonia* has been obtained from the cave formations of this country, *Anaptogonia hiatidens* Cope. It is represented by two series of the inferior molars of the right side, a first inferior molar separate, and some superior molars. The prism-formulæ of these teeth are as follows: (1) 1 six-lobed $\frac{2}{3}$ 1; (2) $\frac{2}{3}$ 1; (3) 1 $\frac{1}{2}$ 1. The first molar is larger than both of the others together. Its triangles $\frac{2}{3}$ are isolated, but anterior to these, one on each side is well defined, but the dentine is continuous with that of the anterior lobe. This lobe consists of two prominent basal loops, and two less prominent terminal rounded lobes, all unsymmetrical. There are thus six keels on each side of the crown and a rounded front border. The triangles of the *M.* $\frac{2}{3}$ are acute, and the anterior of the opposite sides are not fully separated from each other, a strip of dentine connecting them. In the *M.* $\frac{1}{3}$ the triangle of one side is less developed than the other, and the one extremity of the last column is smaller than the other, forming rather a curved process of a terminal triangle of the opposite side. The pulp cavity is well enclosed below, and the two roots are rather small and divergent.

¹See Merriam, North American Fauna, No. 2, 1889, p. 28; On a new Genus and Four new Species of Arvicolinæ.

As compared with *A. rutila* of the northern parts of the earth, this species has double the linear dimensions of the teeth.

<i>Measurements.</i>		<i>m. m.</i>
Diameters of M. $\overline{1}$	{ longitudinal of crown ;	6
	{ anteroposterior ;	4
	{ transverse posteriorly ;	1.6
Diameters of M. $\overline{2}$	{ longitudinal of crown ;	5
	{ anteroposterior ;	2
	{ transverse posteriorly ;	1.5
Diameters of M. $\overline{3}$	{ longitudinal of crown ;	5
	{ anteroposterior ;	2
	{ transverse posteriorly ;	1

The teeth of the second specimen are a little larger than those above measured. They are in a decayed jaw, with the incisor in place, and they agree with the types in all details, excepting only that the external column of the anterior lobe is not grooved.

The first inferior molar, which was originally described and figured, is peculiar in the failure of the anterior triangles to isolate themselves from each other. This character turns out to be inconstant, as in two other corresponding teeth the triangles are closed. The name *Anaptogonia* was applied to the species in a subgeneric sense, and although based on a worthless character, must, under the rules, be retained. It antedates the *Evotomys* of Coues, which was proposed in 1874 in the Proceedings of the Academy of Natural Sciences of Philadelphia, p. 186, for voles with rooted molars.

Anaptogonia cloacina Cope sp. nov.

Crowns prismatic, the common pulp cavity with lateral walls which close the lateral grooves, but do not close the pulp cavities ; no roots.

The dentition of this species is that which is regarded by G. S. Miller as that of the immature stage of the species which were termed by Merriam *Phenacomys*. I do not see that this dentition can be distinguished from that of *Anaptogonia*.²

Two individuals of this species are indicated by the specimens preserved by Mr. Mercer. These include, the first, the M. $\overline{2}$ and M. $\overline{3}$; the second, the M. $\overline{1}$ and M. $\overline{2}$. As usual in this group, the molars diminish in size posteriorly. The triangle formulæ are : M. $\overline{1}$, 1 $\frac{2}{2}$; M. $\overline{2}$, 1 $\frac{1}{2}$; M. $\overline{3}$, 1 $\frac{1}{2}$ + 3 lobes.

² North American Fauna, No. 12, 1896, p. 40.

In the *M.* ¹ the triangles of one side are acute angled ; and of the other, obtuse-angled. The posterior triangle presents an angle posteriorly as well as laterally. In the *M.* ² the same characteristics exist, with the addition that the anterior (terminal) triangle has its acute column pinched together, but not so as to exclude the dentine. In the *M.* ³ the entering angle (groove) of one side enters the triangle of the other side opposite to it, so as to destroy its triangular character. The second triangle of the same side is also reduced by the deep inflection of the opposite groove. Opposite the apex of the second groove, a rudimental third triangle is present in the form of the section of a keel of the surface. This, I reckon as one of the three divisions of the terminal lobe. The other two are not well distinguished, one opposite to the keel just mentioned is an acute angle, and the terminal one is strongly convex. Thus on this tooth there are three keels on one side and four on the other. The anterior (terminal) column is flattened. Excepting on the *M.* ³, all the triangles are well isolated.

<i>Measurements.</i>		<i>m. m.</i>
Diameters <i>M.</i> ¹ sp. no. 1	{ longitudinal ;	7.5
	{ anteroposterior ;	3.3
	{ transverse ;	2
Diameters <i>M.</i> ² sp. no. 2	{ longitudinal ;	6
	{ anteroposterior ;	2.7
	{ transverse :	2
Diameters <i>M.</i> ³ sp. no. 2	{ longitudinal ;	5.5
	{ anteroposterior ;	3
	{ transverse ;	1.7

The walls of the common pulp cavity are broken off in most of the teeth of this species above described, but portions remain in most of them, and in the *M.* ³ they are so far perfect as to show that the pulp cavity is not closed below as in *Evotomys*.

***Microtus diluvianus* sp. nov.**

The numerous species of the genus *Microtus* are distinguished into groups by various characters, e. g., those of the molar teeth, of the size of the ears, tail, etc. The extinct species can be most readily determined by dental characters, and as these are in all the species less matters of proportion, and more a question of the number of parts, they are to be preferred as possessing greater fixity. Thanks to the excellent work of Blasius on the Mammalia of Europe (1859), it is possible to determine the relation of the Amer-

ican species to the types of the divisions proposed by European authors. I am also much indebted to my friend, Mr. S. N. Rhoads for the opportunity of examining skulls of a number of rare North American species, and especially those described by himself from the Pacific coast.

The species differ as to the number of triangles in the first inferior premolar. There is, however, some lack of constancy in the relations of the anterior triangles to the treffle so that I have depended rather on the characters of the second molars in both jaws for convenience of definition of the larger groups. Thus, in the species of the *M. pinetorum* group, the last two triangles on one side fuse to a median position similar to that of the first column. In the other groups, where this tooth has two triangles on each side, the second superior molar differs in the number of its triangles. There are always two on the external side; but the posterior outer may be prolonged to the inner side, or this prolongation may be cut off into a distant triangle. These divisions include the following species:

A. *Second inferior molar, triangles, $\frac{2}{3}$ 1.*

1. Second superior molar, triangles, $1 \frac{2}{3}$, *Agricola* Blasius. *M. agrestis* Europe.
2. Second sup. molar triangles, $1 \frac{1}{2}$ 1, *Myonomes* Raf., *M. riparius*, E. N. Amer.; *M. principalis*, N. W. N. Amer.
3. Second sup. molar triangles, $1 \frac{2}{3}$; *Microtus* Selys (= *Hemiotomys* Selys, *Paludicola* Blas., *Tetramerodon* Rhoads). *M. amphibius*; *M. nivalis*; *M. ratticeps*; *M. campestris*; *M. arvalis*; *M. subterraneus*; *M. savii*, Europe; *M. xanthognathus*; *M. townsendii*; *M. arvicoloides*, N. America; *M. speothen*; *M. sigmodus*; *M. involutus*; *M. diluvianus* Extinct, N. Amer.

AA. *Second inferior molar, triangles, $1 \frac{1}{2}$ 1.*

4. Second super. molar, triangles, $1 \frac{2}{3}$, *Pitymys* McMur. *M. pinetorum*, N. Amer.; *M. didelta*, Extinct, N. Amer.

The large size of *Microtus diluvianus* Cope distinguishes it from all the extinct and recent American members of the genus. It is only represented by the M. $\frac{1}{2}$ =2 of both sides, so that many of its characters remain to be discovered. The triangle formula of these teeth is M. $\frac{1}{2}$ 1 $\frac{2}{3}$, M. $\frac{2}{3}$ 1 $\frac{1}{2}$. In both molars the triangles are acute and are well closed, and the posterior one presents an angle posteriorly. The lateral keels are $\frac{2}{3}$ and $\frac{2}{3}$. The valleys are wide open below.

		<i>m. m.</i>
Diameters M. 1	{ longitudinal ;	9
	{ anteroposterior ;	3.75
	{ transverse ;	2.50
Diameters M. 2	{ longitudinal ;	7.5
	{ anteroposterior ;	3
	{ transverse ;	2.2

Microtus speothen Cope. Proceeds. Amer. Philos. Soc., 1871, p. 87, fig. 13. *Arvicola* (*Pitymys*) *tetradelta*, l. c., 1871, pp. 87-8, fig. 14.

Arvicola tetradelta was founded on the M. 1 and 2 of an individual of smaller size than the types of *A. speothen*, but not otherwise different.

The species *Microtus involutus* from the Port Kennedy deposit is allied to *M. sigmodus*, while *M. didelta* is more nearly related to *M. pinetorum*.

CARNIVORA.

Ursus haplodon sp. nov. *Ursus pristinus* Leidy, Cope, Proceeds. Amer. Philos. Soc., 1871, p. 96, not *Arctodis pristinus* Leidy, Proc. Acad. Philada., 1854, 90; Holmes, Postpliocene Foss. So. Carolina, 1860, 115, pl. xxiii, figs. 3-4.

There are contained in the Academy's collection, remains of thirty-six individuals of this large bear from the Port Kennedy fissure, and parts of several others are included in the Wheatley collection. Study of this material has led me to the conclusion that *Ursus pristinus* of Leidy is a distinct though allied species. The latter was founded on a single tooth, the first inferior true molar of the left side. This tooth cannot now be found, but Leidy has given a figure which is of much excellence from an artistic point of view, and judging from other figures in the same work, is probably trustworthy, especially as it corroborates the description in every particular. I should have hesitated to distinguish the present animal, however, had it not been that the Port Kennedy material includes fourteen teeth from the same position in the jaw, three of which are in the Wheatley collection. These all agree closely and differ from Leidy's animal.

Leidy notes that in *U. pristinus* the anterior width of the tooth exceeds the posterior, and the figure confirms this statement. In *U. haplodon* the extremities of the crown are of equal width. The grinding surface of the crown is in *U. pristinus* rough with tubercles, while it is smooth in *U. haplodon*. This character might be supposed to be due to the attrition of use, but it is universal in the teeth of *U. haplodon* without regard to age. The trigon in *U. pristinus* is triangular; in *U. haplodon* it is a semi-

circle. The apex of the triangle is in *U. pristinus* internal, and it is split by a fissure which separates paraconid from metaconid. In *U. haplodon* the paraconid is wanting. In this respect *U. pristinus* more resembles the modern bears. I suspect that *U. pristinus* is distinct from *U. haplodon*, but of the same group; more approaching the typical *Ursi*. It is of smaller size, about equaling the grizzly.

Ursus haplodon belongs to the American type of the Plistocene and present ages, which is distinguished from the typical *Ursi* by the greater development of the sectorial part of the first inferior true molar. This is due to the more anteroposterior direction of the paraconid, the larger size of the protoconid and the smaller size of the metaconid. The tooth makes a sensible approach to that of *Hyænactos*. To this group belong the following species, and they differ in the following ways:

I. Superior premolars crowded, overlapping. (South American.)

Large species; *U. ornatus* Cuv., *U. bonaerensis* Gerv.
Smaller species; *U. brasiliensis* Linn.

II. Superior premolars uninterrupted, not overlapping. (Californian.)

Muzzle very short; *U. simus* Cope.

III. Superior premolars spaced. (E. N. America.)

Muzzle moderate; *U. haplodon* Cope.

Where *U. pristinus* should be placed in this series can only be ascertained by future discovery. The three species first named are separated from *Ursus* under the name of *Tremarctus* (Gerv. *Arctotherium* Brav.), as the humerus exhibits an entepicondylar foramen. It is not known whether the last two species possess this character or not.

A conspicuous character is common to the living *Tremarctus ornatus* and *Ursus* (? *Tremarctus*) *haplodon*, which is not present in *Tremarctus bonaerensis* of the Pampean beds. There are two maseteric fossæ of the mandible, which are separated by a crest which extends obliquely downward and backward from below the coronoïd process.

The size of the teeth of this species, as well as that of the jaws preserved, exceed the average dimensions of the grizzly bear (*Ursus horribilis*). *U. haplodon* was evidently one of the most

formidable of its genus, and it probably found an abundant supply of food in the sloths of the genus *Megalonyx*, which were the most abundant of the contemporary mammalia.

***Osmotherium spelaeum* Cope.**

This genus is characterized by inferior dentition as in *Mephitis*, but the dental formula Pm. 4, M. 2. Metaconid well developed; heel of sectorial large, cupped.

The inferior dental formula of this genus is that of the extinct form, *Potamotherium*, which intervenes between *Mephitis* and *Lutra*. The typical species of *Osmotherium*, however, resembles *Mephitis* so greatly in its inferior dentition that I suspect that the superior molar formula will be found to be Pm. 3, M. 2, as in *Mephitis*, instead of Pm. 4, M. 2, as in *Potamotherium*. The latter genus is of the Miocene age in Europe and North America, the genus *Brachypsalis* Cope from the Loup Fork formation of Nebraska being probably founded on a species of *Potamotherium*. The presence of an additional premolar is important in the Mustelidae, but might in some case prove to be a mere individual variation, but in the present instance this is clearly not the case.

Osmotherium spelaeum Cope is represented by a left mandibular ramus which contains alveoli or roots of the C. and Pm. 4-2, with Pm. 1 and Ms. 1-2 perfectly preserved.

The ramus is robust, and its inferior border rises from below the heel of M. 1 upward and posteriorly; in *Mephitis mephitica* the ramus is less robust, and the inferior border begins to ascend below the posterior part of the M. II. The anterior border of the masseteric fossa is not sharply defined. There are three mental foramina, the first and second below Pm. 2, and the third below Pm. 1, the anterior being the largest. The molar teeth are much like those of *M. mephitica*, but are more robust. The metaconid is considerably smaller than the protoconid as in *Mephitis putorius*, and smaller than in *M. mephitica*. The borders of the heel are strongly and equally elevated, enclosing the basin completely. The Pm. I differs from that of *M. mephitica* in presenting a flat face inward and posteriorly, which is bounded externally by an angular ridge, as in *M. fossidens*. The crown of the Pm. 2 is mostly lost, but a short, flat transverse heel remains, which is similar to but smaller than that of the Pm. I. The anterior root of Pm. II is opposite the posterior root of the Pm. III; while the Pm. IV is entirely and directly in front of the anterior root of Pm. II, and ex-

ceeds it in size. The dental foramen enters at a point as far posterior to the M. II as the long diameter of the latter, about as in *M. mephitica*.

<i>Measurements.</i>	<i>m. m.</i>
Length of ramus from M. II inclusive,	29
Length of molar series ;	25
Length of true molars ;	13
Length of sectorial ;	10
Width of sectorial at heel ;	5.5
Length of heel of sectorial ;	4.5
Length of crown of M. II ;	3
Depth of ramus at Pm. IV ;	9
Depth of ramus at posterior body of M. I ;	9

The only question as to the validity of this form that can arise, is due to its similarity to *Mephitis fossidens*. See the description of the latter below.

***Mephitis fossidens* sp. nov.**

Two species of the genus *Mephitis* Linn. occur in the bone deposit in considerable abundance. After a cursory examination I referred both of them to *M. mephitica*,³ but a thorough study convinces me that this reference must be reconsidered. I give a table by which they may be distinguished from the best known recent species, *M. mephitica* and *M. putorius*. I add here that Dr. Merriam has endeavored to substantiate the reference of the latter species to a separate genus under the name of *Spilogale*.⁴ He gives a list of characters which he regards as generic, but which are to me specific only, as they only consist of proportions of the skull and teeth.

I. M. 1 with para- and metaconule forming a straight longitudinal crest ; no posterior ledge.

Metaconid small, low ; inferior premolars 2-3 overlapping ; entoconid low ; *M. fossidens* Cope.

II. M. 4 with distinct V-shaped para- and metaconules separated by a fossa inwardly.

Metaconid small, low ; inferior premolars 2-3 not overlapping ; ramus, lower border rising posteriorly ; entoconid low ;

M. orthostichus Cope.

³ Proceeds. Acad. Nat. Sci., Phila., 1895, p. 447.

⁴ North American Fauna, No. 4. 1890, p. 5.

III. M. $\frac{1}{2}$ without metaconule, but with a broad posterior ledge; paraconule V-shaped.

Metaconid small; premolars not overlapping; ramus not rising posteriorly; smaller; *M. putorius* L.

Metaconid large; premolars not overlapping; ramus rising posteriorly; smaller; entoconid elevated: larger; *M. mephitica* L.

The characters above assigned to the species of *Mephitis* are established by numerous specimens. There are twenty-eight individuals represented by jaws and teeth in the Port Kennedy collection. Of them I can only determine fifteen. My own collection and that of the Academy of Natural Sciences include a number of skulls of *M. mephitica*, while the collection of Mr. S. N. Rhoads includes as many more, which he has kindly placed at my disposal. For my knowledge of the cranial dentition of *M. putorius* series I am also indebted to Mr. Rhoads, and to the monograph by Dr. Merriam above cited.

A species of this genus was found by me in a cave breccia in Wythe County, Virginia, and a left mandible ramus with complete dentition was obtained. I described it under the name *Galera perdidida*.⁵ Dr. Coues has suggested that this species was founded on a specimen of *Mephitis putorius*, and on a reëxamination of the specimen I am inclined to believe that he is correct.

*Mephitis fossidens*⁶ is represented by parts of the jaws with teeth of eight individuals. In only one of these do superior and inferior molars occur together, and this one is, therefore, regarded as the type. The species is of the same size as *M. mephitica*, and was supposed at first to be identical with that animal, until further study revealed several important differences.

The peculiarities of the dentition have been already pointed out in the synopsis of species. These are found in the relations of the paraconule and metaconule of the M. $\frac{1}{2}$, in the small metaconid of the inferior sectorial, and in the overlapping of the premolars. The character of the M. $\frac{1}{2}$ is seen in three specimens; of the anterior premolars in one, and of the inferior sectorial in six. The anterior portions of the mandibular rami are often injured, and the canine teeth are preserved in only two specimens, and the incisors in none.

⁵ Proceeds. Amer. Philos. Soc., 1869, p. 177, Pl. III, fig. 1.

⁶ Fur Bearing Animals, 1877, p. 21.

The inferior molars resemble those of *M. mephitica* but differ in the following points: The metaconid is much smaller, resembling that of *M. putorius*. The entoconid is small and low. The Pm. 1 has a flat face, presenting backward and inward and is bounded by a ridge on the external side. This face is rounded in *M. mephitica*. The overlapping of the Pm. 2 and 3 does not occur in the latter. The inferior border of the ramus rises gently from below the posterior part of the M. $\overline{1}$. The angle is prominent and the condyle occupies a position inferior to that seen in *Mephitis mephitica* and *M. putorius*, in the two jaws in which this part is preserved. It does not rise above the level of the molars as it does in *M. mephitica*.

The M. $\overline{1}$ is the most characteristic part of the dentition. The crown is traversed by two parallel anteroposterior crests; the external consisting of the paracone and metacone, and the internal of the paraconule and metaconule. The posterior border is deeply notched between the two, and the anterior border less so. The protocone is represented by a cingulum which occupies the anterior half of the interior base of the crown, enclosing a fossa with the paraconule. Its border then rises vertically to the inner longitudinal crest which it joins about the middle. Just exterior to this crest is a small tubercle which may represent a metaconule. An external cingulum except at the base of the metacone. No anterior or posterior cingula.

In the existing species of *Mephitis* the protocone is continued into a wide ledge round the posterior side of the crown as far as the base of the metacone. The paraconule is V-shaped and does not reach the posterior part of the crown.

<i>Measurements.</i>	<i>m. m.</i>
Diameters of M. $\overline{1}$ { anteroposterior (greatest);	8
{ transverse;	9.5
Length of inferior sectorial;	11
Depth of mandibular ramus at $\overline{m.1}$;	6
No. 2 (with angle of mandible).	
Length of M. $\overline{1}$;	11
Length from M. $\overline{1}$ to condyle;	26
Length from M. $\overline{1}$ to angle;	23.5
Depth of ramus at M. $\overline{1}$;	7.5

	No. 3 (with canine).	m. m.
Length of dental series ;		31
Length of true molars and Pm. 1 ;		21
Length of M. $\overline{1}$;		11.5
Depth of ramus at M. $\overline{1}$;		8

This species represents a section of the genus distinct from *M. mephitica*, with which it is connected by *M. orthostichus* Cope.

Mephitis orthostichus sp. nov.

This species is represented by superior first molars of five individuals and mandibular rami of two others. Unfortunately in no case are inferior and superior dentition of the same individual preserved together. In one individual both rami are preserved.

This species is intermediate in size between *M. mephitica* and *M. putorius*, and resembles the latter species in the small metaconid. It resembles *M. mephitica* in the rising inferior outline of the mandibular ramus, and differs widely from both species in the character of the superior M. $\overline{1}$.

The superior M. $\overline{1}$ instead of presenting two parallel longitudinal crests, has a slightly curved crest representing the paraconule, which reaches a trihedral cusp, the metaconule. Thus is produced an internal longitudinal crest which presents a convexity anteriorly and an angle posteriorly, and an entrant angle between the two. The protocone is a mere cingulum which rises to the apex of the metaconule, and extends no further, so that there is no posterior ledge as in the existing species. While the internal crest is quite different in its zig-zag character from that of *M. fossidens*, the species further differs from the latter in the inferior premolars which do not overlap, and in the inferior size. The posterior border of the M. $\overline{1}$ is not so deeply notched as in *M. fossidens*.

The inferior dentition does not differ from that of *M. mephitica* except in the small metaconid and entoconid, and the flatter posterointernal face of the Pm. 1, in which it resembles *M. fossidens*. The third premolar is in contact with the canine, and has two roots which do not overlap those of the second. The crown is longer than either and has a heel with a recurved rim. The third has the same, while the fourth is a narrow heel, with a recurved rim all around it. In no specimen is the angle of the mandible preserved.

Measurements.

m. m.

	No. 1 ; superior M $\overline{1}$	
Diameters. {	anteroposterior ;	8
	transverse (greatest) ;	8

No. 2; both mandibular rami.		<i>m. m.</i>
Length of premolar series;		11
Length of molar series;		13.5
Diameters M. $\overline{1}$	{ anteroposterior;	10
	{ transverse of heel.	3
Diameters M. $\overline{2}$	{ anteroposterior;	3.5
	{ transverse;	2.5
Depth of ramus at Pm. 1;		9
Depth of ramus at Pm. 2;		10
No. 3; smallest ramus.		
Length of last three molars;		17
Length of M. $\overline{1}$;		9.5
Depth of ramus at Pm. 1;		6
Depth of ramus at M. 2;		8

In two last superior molars the short angle connecting the metaconule with the paraconular crest is rudimental or wanting, so that the arrangement only differs from that of *M. fossidens* in the greater separation of the metaconule from the crest. Such teeth are nearly transitional between the two species, but they maintain the inferior size of *M. orthostichus*. The two types of molars might be regarded as representing male and female, but for the difference in the relations of the inferior premolars, as pointed out in the analytical table of species.

Pelyciotis lobulatus, gen. et sp. nov.

Char. gen.—Dental formula Pm. $\overline{3}$, M. $\overline{2}$. Sectorial with basin-shaped heel, and without metaconid. Premolars without posterior lobe.

The genus *Pelyciotis* is only known from the mandible. The dentition agrees in number of teeth with both *Mephitis* and *Putorius*. From the former it differs in the absence of metaconid, and from the latter in the basin-shaped heel of the sectorial molar. From *Gulo* it differs in the presence of but three premolars. But one species is known, *P. lobulatus* Cope, represented by an entire left mandibular ramus containing all the teeth excepting the third premolar and the incisors.

Char. specif.—This weasel is larger than any of the existing species of *Putorius* of North America, but equals *P. vittatus* of Brazil. In some respects the parts preserved resemble the corresponding ones of *Mephitis orthostichus*, but the differences are also conspicuous. The ramus is rather robust, and the symphysis is short. The inferior border is regularly convex, and rises to the

This species differs from *Lutra canadensis* in two conspicuous points; first, the inferior border of the mandible is a nearly straight line to the angle; second, the third premolar is nearly transverse to the long axis of the jaw in position, in consequence of the much shorter mandibular symphysis.

The coronoid process is at right angles to the horizontal ramus and its anterior and posterior borders are straight and of equal inclination to the obtuse apex; the posterior border is convex in *L. canadensis*. The angle is opposite the base of the sectorial; in *L. canadensis*, it is opposite the apices of the cusps of the sectorial. The anterior border of the masseteric fossa is below the middle of the tubercular molar. The inner side of the ramus is flat and not grooved, except immediately above the angle. The mental foramina are below the middle of the first, and the anterior root of the second premolars.

Both the internal and external borders of the inferior tubercular molar are elevated, the former as a low cusp. The crown is horizontal in position and is not tipped forward as in *L. canadensis*. An external basal cingulum on both this tooth and the sectorial. In the latter the metaconid is well developed; the protoconid and paraconid are broken away. The basin of the heel has the form of that of *L. canadensis*, and the external cutting edge is notched in front. The first premolar is longitudinal in position, but the anterior root of the second premolar is interior to the middle line. The internal root of the third premolar is near the middle of the superior face of the ramus, but the interior root is anterior to the internal border of the anterior root of the second premolar. Both are close to the canine alveolus. The crown of a premolar was displaced and adherent in the alveolus of the root of the paraconid of the sectorial. The crown probably belongs to the second premolar. It has no lobe on its posterior edge, and is expanded posteriorly at the base. The superior tubercular has lost its paracone and metacone. The interior part of the crown is a broad table with the protocone as an obtuse cusp on the interno-anterior border, with a cingulum at its base. This part of the tooth is much like that of *L. canadensis*, but is not so convex posteriorly.

Uncia mercerii Cope. *Proceeds. Academy Nat. Sciences Phila.*, 1895, p. 448.
Crocota inexpectata Cope, l. c., p. 449.

Additional material of this large feline confirms its distinctness. The sectorial tooth referred to the genus *Crocota* as above cited,

with reservation that it might be found to pertain to a feline animal, must be referred here. The superior sectorial is peculiar in the small indication of protocone as in the *Smilodons*.

DIPLARTHRA.

Cariacus lævicornis sp. nov.

A series of superior molars of the right side lacking the last one, represents this species. There were obtained at about the same time the basal parts of the antlers of two deer of the same size, which I suspect to belong to this species. There are various bones of the skeleton of probably the same.

The true molars have internal basal columns, and the internal crescents send backward and outward processes into the lakes, as in the existing North American species of the genus. The molars are of the size of those of *C. virginianus*, but the premolars are smaller. The first and second are especially reduced in anteroposterior diameter, and while the third is larger than these, its form is different from that of the corresponding tooth in any species of this genus or of *Coassus*. The anteroposterior diameter of the crown does not exceed the transverse, and there is no ridge of the external face such as is present in all the *Cervi*, but only a slight convexity. This ridge is present, but indistinct in the other premolars. It is very strong on the paracone of the true molars, but weak on the metacone. The horns of all the crescents are well developed. The width of the base of the crowns of the true molars is greater anteriorly than posteriorly. There are no processes entering the lakes of the premolars such as are usual in the species of *Cariacus*.

	<i>Measurements.</i>	<i>m. m.</i>
Diameters of Pm. 1	{ anteroposterior ;	11
	{ transverse ;	12
Diameters of M. 1	{ anteroposterior ;	15
	{ transverse ;	16
Diameters of M. 2	{ anteroposterior ;	16
	{ transverse ;	16.5

The fragments of horns both include the bur. This is not very prominent, and the beam is quite smooth. There are indications of tines, but they are broken off at the bases. In the shorter fragment a tine is given off on the internal side, but it is broken off near the base, and the beam beyond its base is also lost. In the second fragment the position corresponding to the internal tine is split away

Above it the beam is somewhat compressed anteroposteriorly, and sends off a smaller tine directly anteriorly. The beam in both is entirely smooth.

<i>Measurements.</i>	<i>m. m.</i>
Diameters of beam No. 1 at base { anteroposterior ;	18
transverse ;	16
Elevation to internal tine ;	13.5
Anteroposterior diameter of beam No. 2 at base ;	17.5
Anteroposterior diameter of beam No. 2 at superior base of anterior tine ;	15.5
Transverse diameter of anterior tine ;	14
Elevation of anterior tine above base ;	27

The smoothness of the beam of the horns distinguishes this species from the existing species of *Cariacus* of both North and South America, and resembles the condition seen in the species of *Coassus*, where the horns are unbranched. The inferior tine originates nearer the bur than in the known species of *Cariacus*, while the anterior tine is present only in species (*C. campestris*) where the interior tine is absent. The longer beam preserved shows no tendency to an anterior curvature such as is present in most of the species of the genus.

The true molar teeth of this species are of about the same size as those of the Virginia deer.